

## What is Biomass?

Biomass is any biological material that can be used as fuel to produce heat, electricity, or both heat and power. Wood biomass includes wood chips, wood pellets and other low-grade wood wastes. Other common biomass fuels are agricultural crop residues and farm animal wastes.



Wood chips



Typical wood chip boiler



Wood pellets



Typical wood pellet boilers

## Why Use Biomass For Energy?

Biomass is a renewable fuel that can be sustainably produced. It makes sense to use biomass in place of conventional, nonrenewable fossil fuels - oil, gas, and coal - for several good reasons:

\* **Biomass fuel is a local product.** Biomass is grown and harvested on local and regional forests and farms. Dollars spent on biomass fuel stay in the regional economy, creating jobs and supporting forestry and agriculture.

\* **Biomass is easy to use and has high energy content.** Wood pellets or wood chips are a clean-burning, high energy renewable fuel that is convenient to use and requires less storage space than other biomass fuels.

\* **Biomass fuel prices are generally lower and more stable.** Biomass fuels have increased by only about 1 percent per year over the past 20 years and have historically been lower-priced than fossil fuels.

\* **Biomass energy is good for the environment.** Using carbon-neutral biomass in place of fossil fuels helps reduce atmospheric buildup of greenhouse gases, which contribute to climate change. Biomass energy systems help keep forests healthy by providing a market for low-grade "cull" wood, whose removal improves the well-being of the forest and the value of commercial trees.

Paying \$40/ton for wood chips is the same as paying \$0.72/gallon for heating oil; \$0.51/gallon for propane; \$5.50/1000 cu. ft. for natural gas; and \$0.02/kWh for electricity.

## Getting Started:

### New Hampshire Wood Biomass Heating Project

The New Hampshire Wood Biomass Heating Project is a partnership of federal, state, and private agencies for the purpose of promoting the use of biomass heating systems in municipal, county, and school buildings throughout the state. A grant from the U.S. Forest Service will help fund workshops on the use of biomass heating systems, tours of existing systems in the state, and feasibility studies for building owners considering the use of biomass heating systems in their facilities.

Dozens of wood biomass fuel systems are currently at work in different parts of the U.S., heating schools, government complexes, and entire city downtowns, as well as producing renewable electricity. Many schools and other facilities in Vermont, and a growing number in New Hampshire, are now heated with biomass heating systems. Some examples are below:

Paying \$200/ton for pellets is the same as paying \$1.67/gallon for heating oil; \$1.18/gallon for propane; \$12.50/1,000 cu. ft. for natural gas; or \$0.04/kWh for electricity.



**Merrimack Valley High School and Middle School, Penacook, NH** - This heating system produces 6.74 MMBtu/hr, using approximately 636 tons of wood chips annually. It supports both schools, a total of 230,000sf, and serves 1,500 students from six area towns.

### **Crotched Mountain Rehabilitation Center, Greenfield, NH**

A 12MMBtu dual boiler, biomass district hot water heating system installed in 2007 supplies heat, hot water and some cooling to 275,000sf with room for growth. The facility uses 3,000 tons of green hardwood bole chips annually and features a multicyclone and baghouse to capture emission particulates. A unique chip storage area allows trucks to drive into the bins to unload.



**Hanover High School, Hanover, NH** - This facility serves approximately 700 students from Hanover and Norwich, VT, utilizing a Messersmith boiler. to produce 5.0MMBtu/hr. from approximately 223 tons of wood chips per year.

## Project Partners *(as of printing)*

North Country Resource Conservation & Development (RC&D)	Plymouth State University - Center for Rural Partnerships
US Forest Service, State & Private Forestry, Northeastern Area	NH Timberland Owners Association
US Forest Service, White Mountain National Forest	NH Dept. of Environmental Services
NH Department of Education	Biomass Energy Resource Center
UNH Cooperative Extension	Crotched Mtn. Rehabilitation Center
NH Office of Energy & Planning	Merrimack Valley School District
The Jordan Institute	Audubon Society of NH
NH Division of Forests & Lands	Nubanusit Neighborhood & Farm
New England Wood Pellet	Hanover High School
	Town of Lyme, NH
	NORESCO

### Biomass Heating Tidbits

Schools in Vermont have been converting to wood biomass for close to 30 years. Below is some information about their 2005-2006 heating season:

- \* Average annual fuel savings of \$42,000 per school.
- \* 80 percent reduction in the amount of fossil fuels (equivalent to 70,000 gallons of oil).
- \* See [www.biomasscenter.org](http://www.biomasscenter.org) for more details.

### For More Information:

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### Websites for additional information and resources:

Biomass Energy Resource Center - [www.biomasscenter.org](http://www.biomasscenter.org)  
Fuels for Schools - [www.fuelsforschools.org](http://www.fuelsforschools.org)  
Massachusetts Wood Pellet Guidebook - [www.mas.gov/Eoca/docs/doer/pub\\_info/doer\\_pellet\\_guidebook.pdf](http://www.mas.gov/Eoca/docs/doer/pub_info/doer_pellet_guidebook.pdf)  
New England Wood Pellets - [www.pelletheat.com](http://www.pelletheat.com)  
Harris Center for Conservation Education - Wood Pellet Boiler - [www.harriscenter.org/Building/boiler.htm](http://www.harriscenter.org/Building/boiler.htm)  
Crotched Mountain Woodchip Plant - [www.crotchedmountain.org/crotchedmountain/html/woodchipplant.htm](http://www.crotchedmountain.org/crotchedmountain/html/woodchipplant.htm)

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# THE NEW HAMPSHIRE WOOD BIOMASS HEATING PROJECT

*A Program to Help Public Schools and Public Buildings in N.H. Consider Wood Biomass Heating Options*

**Money Really Does Grow On Trees!**



**Learn how to save money by lowering your heating fuel bills with a biomass heating system like this one.**

